

CLAIM LISTING

Claims 1 - 3 (canceled)

Claim 4 (original) In a lifting foil the combination of:

- (a) A lower course having a lower starboard margin and a lower port margin, said lower course extending sideward between said lower starboard margin and said lower port margin for generating a first fluid reaction force having an upwardly directed lifting component,
- (b) An upper course having an upper starboard margin and an upper port margin, said upper course being positioned above said lower course and extending sideward between said upper starboard margin and said upper port margin for generating a second fluid reaction force having an upwardly directed lifting component,
- (c) A starboard flow guide extending vertically between said lower starboard margin and said upper starboard margin, for suppressing starboard-side vortex generation, and
- (d) A port flow guide extending vertically between said lower port margin and said upper port margin, for suppressing port-side vortex generation.

Claim 4. (Currently Amended) In a lifting foil the combination of

- (a) A lower course having a lower starboard margin and a lower port margin, said lower course extending sideward between said lower starboard margin and said lower port margin and being responsive to fluid flow in a direction -X, for generating a first fluid reaction force[having an upwardly directed lifting component,] having a first lifting component in a direction -Z,
- (b) An upper course having an upper starboard margin and an upper port margin, said upper course being positioned above said lower course and extending sideward between said upper starboard margin and said upper port margin for generating a second fluid

reaction force [having an upwardly directed lifting component,] having a second lifting component in said direction, -Z, parallel and additive to said first reaction force.

(c) A starboard flow guide extending vertically between said lower starboard margin and said upper starboard margin, having a progressively adjusted camber for suppressing [starboard-side vortex generation,] spanwise fluid flow in a direction +Y, perpendicular to -X and -Z, and

(d) A port flow guide extending vertically between said lower port margin and said upper port margin, having a progressively adjusted camber for suppressing [port-side vortex generation,] spanwise fluid flow in a direction -Y, opposite to +Y.

Claim 5 (Original) A lifting foil according to claim 4, wherein said flow guides are secured to said courses by smooth, continuous connections which blend into said courses at said margins

Claim 6.(Original) A lifting foil according to claim 5 further comprising, means defining a plurality of boundary lines and a plurality of surfaces bounded by said plurality of boundary lines.

Claim 7.(Original) A lifting foil according to claim 6 wherein said plurality of boundary lines are 4 in number.

Claim 8. (Original) A lifting foil according to claim 7 wherein said plurality of surfaces are 3 in number.

Claim 9. (Original) A lifting foil according to claim 8 wherein said lifting foil has a vertical crossection which is generally elliptical.

Claim 10. (Original) A lifting foil according to claim 9 wherein said vertical crossection has a ratio of major axis to minor axis ranging between 1.6 and 10.5.

Claim 11. (Original) A lifting foil according to claim 9 wherein said vertical crossection has a ratio of major axis to minor axis which is approximately 3.0.

Claim 12. (Original) A lifting foil according to claim 9 wherein said upper course is rearwardly offset from said lower course.

Claim 13. (Original) A lifting foil according to claim 9 wherein said fuselage is situated midway between said flow guides, said lifting foil being provided with a large starboard passage situated between said fuselage and said starboard flow guide, and a large port passage situated between said fuselage and said port flow guide.

Claim 14 (Original) A lifting foil according to Claim 8 said three surfaces comprising a first surface defining said port passage, a second surface defining said starboard passage and a third surface defining the exterior shape of said lifting foil.

Claim 15 (Original) A lifting foil according to claim 14, said fuselage being enclosed by cooperative coverage from said first, second and third surfaces.

Claim 16 (Original) A lifting foil comprising:

- (a) a lower course having a lower starboard margin and a lower port margin, said lower course extending sideward between said lower starboard margin and said lower port margin for generating a first fluid reaction force having an upwardly directed lifting component,
- (b) an upper course having an upper starboard margin and an upper port margin, said upper course being positioned above said lower course and extending sideward between said upper starboard margin and said upper port margin for generating a second fluid reaction force having an upwardly directed lifting component,

- (c) a starboard flow guide extending vertically between said lower starboard margin and said upper starboard margin, for suppressing starboard-side vortex generation,
- (d) a port flow guide extending vertically between said lower port margin and said upper port margin, for suppressing port-side vortex generation, and
- (e) said lower course having a keel-shaped underside to provide a sideslip-reducing dihedral angle.

Claim 16 (Currently Amended) A lifting foil [comprising

- (a) a lower course having a lower starboard margin and a lower port margin, said upper course extending sideward between said lower starboard margin and said lower port margin for generating a first fluid reaction force having an upwardly directed lifting component,
- (b) an upper course having an upper starboard margin and an upper port margin, said upper course being positioned above said lower course and extending sideward between said upper starboard margin and said upper port margin for generating a second fluid reaction force having an upwardly directed lifting component,
- (c) a starboard flow guide extending vertically between said lower starboard margin and said upper starboard margin, for suppressing starboard-side vortex generation,
- (d) a port flow guide extending vertically between said lower port margin and said upper port margin, for suppressing port-side vortex generation, and] according to claim 4
wherein said lower course comprises
- [(e) said lower course having] a keel-shaped underside to provide a sideslip-reducing dihedral angle.

Claim 17.(Original) A lifting foil comprising

- (a) A lower course having a lower starboard margin and a lower port margin, said lower course extending sideward between said lower starboard margin and said lower port margin for generating a first fluid reaction force having an upwardly directed lifting component,

(b) An upper course having an upper starboard margin and an upper port margin, said upper course being positioned above said lower course and extending sideward between said upper starboard margin and said upper port margin for generating a second fluid reaction force having an upwardly directed lifting component,

(c) A starboard flow guide extending vertically between said lower starboard margin and said upper starboard margin, said starboard flow guide comprising:

- (i) a first upper section secured to said upper starboard margin,
- (ii) a first lower section secured to said lower starboard margin, and
- (iv) a first mid-section positioned between said first upper section and said first lower section,

(d) A port flow guide extending vertically between said lower port margin and said upper port margin, said port flow guide comprising:

- (i) a second upper section secured to said upper port margin,
- (ii) a second lower section secured to said lower port margin, and
- (iv) a second mid-section positioned between said second upper section and said second lower section,

Claim 17. (Currently Amended) A lifting foil comprising:

(a) A lower course having a lower starboard margin and a lower port margin, said lower course extending sideward between said lower starboard margin and said lower port margin for generating a first fluid reaction force having an upwardly directed lifting component,

(b) An upper course having an upper starboard margin and an upper port margin, said upper course being positioned above said lower course and extending sideward between said upper starboard margin and said upper port margin for generating a second fluid reaction force having an upwardly directed lifting component,

(c) A starboard flow guide extending vertically between said lower starboard margin and said upper starboard margin, said starboard flow guide comprising:

- (i) a first upper section secured to said upper starboard margin,

(ii) a first lower section secured to said lower starboard margin, and
(iv) a first mid-section positioned between said first upper section and
said first lower section,

(d) A port flow guide extending vertically between said lower port margin and
said upper port margin, said port flow guide comprising:

(i) a second upper section secured to said upper port margin,
(ii) a second lower section secured to said lower port margin, and
(iv) a second mid-section positioned between said second upper section
and said second lower section,

said starboard flow guide and said port flow guide having cambered cross-sections
characterized by a camber which is substantially zero at an associated flow guide mid-point and
which increases progressively to maximum values at opposite ends of associated flow guides.

Claim 18. (Canceled)

Claim 19. (Original) A lifting foil according to Claim 17 wherein said upper course is
offset upwardly and rearwardly of said lower course.

Claim 20. (Original) A lifting foil according to Claim 19 wherein said upper course is
swept forwardly on two sides of a center line extending in an X-direction through said
lifting foil, and said lower course is swept rearwardly on two sides of said center line.

Canceled

Claim 21. (Original) A method of suppressing vortices at tips of upper and lower
biplane wings comprising the steps of:

- (1) Collecting fluid flowing spanwise at said tips, and
- (2) Directing collected fluid to common termination points between adjacent wing tips.

Cancelled

Claim 22. (Original) Method of vortex suppression according to claim 21 further comprising the step of progressively reducing a dynamic pressure of fluid being directed to said termination points.

Claim 23. (New) A lifting foil comprising:

- (a) an upper course including an upper starboard end and an upper port end,
- (b) a lower course including a lower starboard end and a lower port end, said lower course being generally parallel to said upper course with said lower starboard end facing said upper starboard end and said lower port end facing said upper port end,
- (c) a starboard flow guide having an upper starboard guide section connected to said upper starboard end, a lower starboard guide section connected to said lower starboard end, and a starboard mid-section connecting said upper starboard guide section to said lower starboard guide section, and
- (d) a port flow guide having an upper port guide section joined to said upper port end, a lower port guide section joined to said lower port end and a port mid-section connecting said upper port guide section to said lower port guide section;

 said starboard flow guide having a camber which increases progressively from a minimum camber at a mid-point of said starboard flow guide to a maximum camber at said upper starboard end and also being cambered progressively from said mid-point to said lower starboard end

 said port flow guide having a camber which increases progressively from a minimum camber at a mid-point of said port flow guide to a maximum camber at said upper port end and also being cambered progressively from said mid-point to said lower port end.